BACKGROUND—FIELD OF INVENTION

This invention relates to Christmas tree stands, specifically to the simple manner of preparing the tree by the use of a pot nailed to the tree. The tree is then easily installed into the stand. Making the final adjustment of the tree to stand up straight every time is quickly and simply done. One slides the bowl with the pot and tree, on the spherical matching surface of the base. The bowl of the stand holds sufficient water to last the entire season, thus keeping the tree green and reducing the fire hazard. It is easy to take the tree down at the end of the season and to empty the residual water in the bowl by simply pouring it into the sink, toilet bowl or tossing it outside. The tree lot personnel can install the pot and all the homeowner has to do is fill the bowl with water, put on the cover, set the tree into the bowl and slide the bowl in the proper direction to straighten the tree.

BACKGROUND-DESCRIPTION OF PRIOR ART

Initially tree stands consisted of two crossed boards. The tree bottom was nailed into the boards. There were no provisions for a source of water. Later a plastic bowl was placed on the boards and the tree bottom was nailed through the bowl. A soft mastic or waterproof roofing material was placed between the bowl and the boards to prevent water leakage. The tree was straightened by loosening the nails on the tilt side and the tree straightened. It was difficult to get the residual water out of the bowl at Season's end. The bowls occasionally leaked. The bowl, cross boards and tree were discarded at the end of the season, the cost of the bowl and boards was not recoverable.

Another design used a small bowl with a spike at the bottom, a metal ring went around the top of the stand and four drop hammered metal legs were held by this ring. To support the tree, four opposing screws were turned against the tree trunk The tilt of the tree was adjusted by loosening one or two screws on one side and tightening one or two screws on the opposite side. This was extremely difficult to do since one had to be down low on the floor. It really required two people, one to hold the tree up straight and one to tighten the screws. The bowl didn't hold enough water and the cat used the water as its own private drinking source. The screws were difficult to adjust properly and the stand could only hold small trees.

A number of tree designs use a swivel principle to get the tree to stand up straight. All of these use complicated mechanical means of holding and adjusting the tree trunk. They work primarily for smaller type trees and all do not hold enough water.

A three rebar welded legs with a center spike, which is inserted into the bottom of the tree, has been in use. A plastic bowl rests on top of the rebar. The plastic bowl has a center hole in the bottom with a rubber grommet attached. The rebar spike is pounded through the grommet and hole in the bottom of the trunk of the tree. The tree trunk must be cut absolutely straight across perpendicular to the centerline of an upright tree, since the trunk bottom rests on the bowl and top of the rebar. The hole that is drilled into the tree must be drilled absolutely in line with the centerline of a straight upright tree to accept the spike. The spike is partially serrated with horizontal grooves to hold the tree firmly. If the hole is drilled crooked, the assembly has to be pulled, rotated, or pounded loose and that is a major chore since the serrations dig into the tree. Next the drilled hole has to be plugged and redrilled, or the trunk cut off, redrilled and the rebar stand pounded back in. When it is time for the homeowner to remove the stand, that is a major problem. The task is so difficult that many just throw out the stand with the tree. That expense is not recoverable. The grommet could and would leak and the floor or carpet is ruined. Getting the residual water out of the bowl at the end of the season is very difficult and time consuming, one uses sponges and towels to soak up the water and rinse out same. The ends of the rebar dig into the floor or carpet and the owner must buy plastic caps to fit over the rebar ends. The stand cannot be conveniently moved and certainly not rotated without lifting up tree and stand.

The previous patent by Welzen used a sliding clip device to hold the nails, this device was not strong enough to withstand loads imposed on them when the tree was tipped to install. The stand used a one-piece blow molded container, which was expensive to manufacture, took up a lot of space and increased the cost of shipping and storage. With the exception of the previous patent by Welzen, all previous tree stands did not hold sufficient water to keep the tree green all season long to reduce the fire hazard. All are complicated with many manufactured detailed parts. They make it difficult to set up the tree and to take it down.

SUMMARY

The present invention solves the problems mentioned above. The bottom of the tree does not have to be sawed straight. There are no holes that must be perfectly drilled into the bottom of the tree. It is easy to hammer a small spike through the guide of the base of the pot and into the base of the tree to keep the pot from skidding. It is simple to hammer in four nails, guided and held by two holes in the curved lip of the pot and into the trunk of the tree to hold the tree very securely to the pot. The tree lot personnel can do this set up work.

The customer takes home the tree and pot. The base is located on the floor where the tree should be set up. A large bowl, which holds 3 gallons of water, is placed on top of the base and the water poured in. A cover is placed over the bowl. The cover has a central hole to match the pot shape. The inner lip of this hole slopes down and inward to match the sides of the pot. The inward sloping lip acts as a guide to aid in inserting the tree with pot into the stand. Next the tree is made to stand straight by sliding the bowl, with its spherical lower surface on the spherical upper surface of the base to correct the slant of the tree trunk. At the end of the season, the tree and pot are lifted out, drip dried and taken out back to be discarded. The bowl, with residual water is easily picked up and poured into the toilet bowl, the sink, or tossed outside. The cover is placed on the bowl; the stand is then conveniently stowed by sliding all under the bed for use next year.

OBJECTS AND ADVANTAGES

Besides the objects and advantages of the above mentioned inventions, several objects and advantages present are:

(a) to provide a tree stand that is easy to set up and to stand straight;

(b) to provide a tree stand that is easy to take down at the end of the season;

(c) to provide a tree stand that holds sufficient water to last the entire season, thus keeping the tree green, which reduces the fire hazard;

(d) to provide a bowl that is easy to empty at the end of the season;

(e) to make it easy to install a pot to the base of the tree by using four nails;

(f) to make it easy to keep the tree from sliding in the pot by means of a spike driven through the bottom of a pot guide and into the tree.

(g) to make it easy to insert the tree into the stand by using a sloping downward rim around the hole opening of the cover that matches the pot sides, making it easier to guide and install the pot into the stand;

(h) to have a raised ring around the bottom of the pot area to firmly keep the pot with tree, from sliding sideways;

(i) to have an inwardly slanted ramp area at the top of the raised ring to engage the lower outer edge of the bowl to guide it into position, thus making it easier to install the tree where visibility to see the pot behind the branches is limited;

(j) to design the parts so they can be easily vacuum formed from standard sheets;

(k) to design the parts so they may also be injected molded using a suitable plastic such as HDPE.

(l) to design the parts to be symmetrical about the center line for ease of manufacture;

(m) to design in a suitable draft on all parts to allow the parts to be pulled easily from the vacuum form mold, or from the injection molded machine;

(n) to design the pot to be injected molded to reduce piece price;

(o) to design the upper lip of the pot so that it extends out and down to provide two guide holes to insert the nail to hold it true and steady when being pounded into the tree;

(p) to design the outer lower lip of the upper pot area to be positioned just a small clearance above the cover surface to keep the cover down in the event unusual circumstances want to lift the cover when the tree is attached;

(q) to design the parts with sufficient draft so they can be readily stacked for minimum shipping volume, thus reducing the costs of the parts;

(r) to design the tree stand to eliminate machined parts that are difficult to manufacture;

(s) to design a tree stand that has no moving mechanical parts that can wear or break;

(t) to provide a return lip around the bottom outer lip of the base so the tree with stand can be slid on the hard floor or carpet to a new location as desired;

(u) to provide round parts to allow the tree to be rotated to install and remove decorations and lights and to show off the best branches;

(v) to design the pot so that the nails see only side loads and no axial loads;

(w) to design the pot so that at least two nails are resisting side loads at all times;

(x) to use a spherical radius at the bowl bottom with a pivot one third of the way up on a tree. With a nine foot tree (108 inches), the spherical radius of the bowl is set at 36 inches with the matching spherical radius of the base being set at a smaller radius such as 34 inches or smaller from the identical above pivot point;

(y) to provide a means of catching spilled water unto the base upper spherical shape and to the raised outer lip of the base.

(z) to provide a cloth, preferably plastic, to be placed on the floor upon which rests the base of the stand. To easily move the stand with tree installed, by gripping the edge of the cloth and pulling it in the direction that the stand must go. This cloth, preferably white in color can also be folded up around the base to disguise the stand.

(aa) to provide a pot to hold the tree, which has a plurality of holes in the bottom to allow water to come up into the pot to water the tree. These same holes allow water to gush into the pot at the time the tree is inserted into the stand. At the end of the season, these holes allow the residual water to drain out feely as the tree is lifted out.

DRAWING FIGURES

The invention is further described and functions noted and explained by the use of the following Figurative Drawings:

Fig 1 is an isometric view of the tree stand showing relative positions of the components of the assembly.

Fig 2 shows an exploded view of the components of the tree stand. The spike at the bottom of the pot is shown in the cross section of Fig 5.

Fig 3 is a top view of the tree stand assembly. The cross section of the assembly is taken at Section line 4-4.

Fig 4 is the cross section showing the cross sectional of the assembly taken at Section 4-4.

Fig 5 is an enlarged view of the right half of the cross section. Note: revolving the cross section about the centerline generates all parts.

LIST OF REFERENCE NUMERALS

10 Assembly	**28 tree cut slant**	**44 cover skirt**
20 Tree	**31 pot side**	**46 cover flange**
22 Nail	**32 dome top**	**51 raised ring**
24 Spike	**33 corner of pot**	**52 bowl flange**
30 Pot	**34 cylinder**	**53 ring ramp**
40 Cover	**36 guide hole**	**54 surface**
50 Bowl	**37 guide hole**	**56 corner**
60 Base	**38 top rim**	**62 surface**
70 Sheet	**39 lower lip**	**64 curved lip**
26 tree cut	**42 cover top**	

DESCRIPTION AND OPERATION OF THE INVENTION

Refer to **Fig 4** and **Fig 5**. The complete assembly **10** is shown with all components in their relative positions. The lower trunk of the tree **20** is shown in phantom. The end of the tree **20** is held from sliding sideways by the spike **24**, which is driven through the extended cylindrical section **34** of the pot **30** and into the tree **20.** The cylinder **34** locates the spike centrally and acts as a guide and holding device while the spike is inserted and driven into the base of the tree. It is not necessary that the tree trunk

be sawed off absolutely straight **26** since the dome shape **32** of the pot **30** allows for the insertion of a non-straight cut **28** of the tree.

The four nails **22** equally spaced radially on the pot **30** are driven into the tree trunk using guide holes **36, 37** to support the nails and allows the nails to be driven and positioned easily toward the center of the tree. The nails **22** are driven into the tree trunk just far enough, approximately one inch deep, to grip the tree firmly to resist side loads only. The nails **22** are located close to the upper rim **38** to allow the side loads on the nails to be easily transmitted to the upper rim, hence into the sloping sidewalls **31** of the pot **30**.

The lower outer rim **39** of the pot is designed with an approximate .032 clearance from the cover top **42** to act as a safeguard, should the cover for some reason try to lift up and out. The lower portion of the pot rim **39** prevents the cover from lifting up while the tree **20** is in the stand.

The loads transmitted to the sloping wall **31** are reacted by the sloping inward lower flange **44** of the cover **40**. The loads then travel to the cover top **42** opposite of the tree load and are introduced into outer downward outer sloping rim **52** of the bowl **50**. The load is then transmitted to the lower spherical surface **54** of the bowl **50** where it is introduced into the upper spherical surface **62** of the base **60**. The load then travels into the outer return lip **64** of the base **60** and is resisted by friction with the floor surface. The outer lip **64** also resists the downward weight of the tree and the water and transmits it to the floor surface in a downward direction. All this load transfer explanation is shown to illustrate why the component features are designed in the special manner in which they are.

If the tree **20** is accidentally tipped or tries to tip because of an unbalanced weight distribution of the tree **20**, the tip load is introduced into and pivots about the outer lower corner **56** of bowl **50** where the load is resisted by the upper spherical surface **62** of the base **60**.

The tipping load also pivots about the lower corner **33** of the pot **30**. This pivoting tipping load of the pot is resisted on the opposite side by the raised rim **51** of the bowl **50**. The raised rim **51** has to be high enough to prevent the corner **33** of the pot **30** to slip out of the raised rim **51**.

When the tree **20** and pot **30** are introduced into the stand, the slope of inner downward lip **44** is deep enough to aid in guiding the pot **30** into the bowl **50** due to the matching angle of the sides. As the pot **30** approaches the bowl **50** bottom, it could be tilted slightly. If this is occurring, the bowl **50** has an inward slanting ramp **53** which contacts the lower rim **33** of the tipped pot **30** and directs it to slide down the ramp **53** and into the raised rim **51** where it is held snuggly.

All components have sufficient draft to allow the parts to be stacked, thus saving shipping cost. The draft also allows the parts to be released easier from the injection molding machine and it also reduces wear on the tool surfaces.

RAMIFICATIONS OF INVENTION

As heavier and larger trees are purchased, the tree stand may embody additional stiffening members to accommodate the larger, heavier trees. This can be accomplished by making the components thicker or by the addition of stiffening pillow ribs in the bottom of the bowl.

The parts can be injection molded where the part can be selectively made thicker and stronger in required areas. Gussets and ribs can be designed in to accommodate critically stressed sections of the design.

Am alternate design of the bowl bottom, may be to segment the raised central bottom into quadrants with a half inch of space between the quadrants.

In lieu of nails, a long screw, slightly larger than the existing 20D 4 inch long nails may be used. The shank of the screw would have the same diameter as the nails and the end portion would be threaded for a one inch distance. The screw may have a flattened thumbscrew head, which could be used to pound in the screw to engage the threads and finish up by turning the threads for engagement;

In lieu of the spike, a regular plated screw of a one inch length with equivalent diameter as the nail may be used.

Note that the parts can be generated, by using one half of the cross section and rotating it around the centerline of the assembly.

An alternate approach to the spherical surface of the bowl is to use a flat bottom where only the end of the rim of the bowl slides on the spherical surface of the base.

An alternate approach to the base is to use members that would provide the benefit of a spherical surface. This would consist of components such as curved spokes-like tubing, or circular ringed tubing set to match a spherical surface level. These may be made of metal or plastic. Metal or plastic curved beams having the same radius of curvature as the spherical bottom may be used. The bowl could slide on these segments of a simulated spherical surface or any other portion of a spherical surface utilized.